Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1-40. (Cancelled)

41. (Currently amended) A method for transmitting a signal comprising:

inputting a bit stream;

determining a characteristic of ~~channel fading for~~ a wireless channel;

selecting a signal constellation from a plurality of ~~one of several~~ signal constellations based on the determined characteristic, the selected signal constellation including a plurality of constellation points, the plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points;

converting the input bit stream to symbols ~~of~~ based on the selected signal constellation to encode the ~~characteristic~~ input bit stream in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated ~~symbols~~ carrier wave over the wireless channel~~;~~ ~~wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance~~.

42. (Currently amended) The method of claim 41, wherein the characteristic ~~of channel fading~~ comprises a signal to noise ratio.

43-44. (Cancelled)

45. (Currently amended) The method of claim 41, wherein ~~determining~~ the characteristic ~~of channel fading~~ is determined from a signal received over the wireless channel.

46. (Currently amended) The method of claim 41, wherein selecting the signal constellation from the plurality of ~~one of several~~ signal constellations is further based on a number of transmit antennas used in ~~the~~ transmitting the modulated carrier wave.

47. (Previously Presented) The method of claim 46, wherein the number of transmit antennas used in the transmitting is greater than one, and is determined from a message received over the wireless channel.

48. (Currently amended) The method of claim 47, wherein the number of transmit antennas is ~~given~~ included in a header of the message.

49. (Currently amended) A device comprising:

a transmitter;

an antenna coupled to the transmitter for transmitting a signal over a wireless channel;

~~a storage medium for storing a plurality of signal constellations;~~

a processor, coupled to ~~the storage media and~~ the transmitter~~, for~~;

a computer-readable medium including computer-readable instructions stored therein that, upon execution by the processor, perform operations comprising

determining a characteristic of ~~fading channel fading for~~ the wireless channel;

selecting ~~one of the~~ a signal constellation from a plurality of stored signal constellations based on the determined characteristic, the selected signal constellation including a plurality of constellation points, the plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points; and

converting the input bit stream to symbols ~~of~~ based on the selected signal constellation ~~so as~~ to encode the ~~characteristic~~ input bit stream in an amplitude of the symbols; and

a modulator having an input coupled to an output of the processor and an output coupled to the antenna, the modulator configured to modulate ~~for modulating~~ a carrier wave in phase and amplitude in accordance with the symbols~~; wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance~~.

50. (Currently amended) The device of claim 49, wherein the characteristic ~~of channel fading~~ comprises a signal to noise ratio.

51-52. (Cancelled)

53. (Currently amended) The device of claim 49, further comprising a receiver, ~~and~~ wherein ~~determining~~ the characteristic ~~of channel fading~~ is determined from a signal received over the wireless channel at the receiver.

54. (Currently amended) The device of claim 49, wherein the antenna comprises a plurality of transmit antennas, and wherein selecting ~~one of several~~ the signal constellation[[s]] is further based on a number of the plurality of transmit antennas used in ~~the~~ transmitting the signal.

55. (Currently amended) The device of claim [[55]] 54, wherein the number of the plurality of transmit antennas used in ~~the~~ transmitting the signal is greater than one, and is determined from a message received over the wireless channel.

56. (Currently amended) The device of claim 55, wherein the number of the plurality of transmit antennas is ~~given~~ included in a header of the message.

57. (Currently amended) A computer program of computer ~~machine~~-readable instructions, tangibly embodied on ~~an information bearing~~ a computer-readable medium and

executable by a digital data processor[[,]] to perform actions directed toward transmitting a signal, ~~and actions comprising~~ the computer-readable instructions configured to cause a device to:

~~determining~~ determine a characteristic of ~~channel fading for~~ a wireless channel;

~~selecting~~ select a signal constellation from a plurality of ~~one of several~~ signal constellations based on the determined characteristic, the selected signal constellation including a plurality of constellation points, the plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points;

converting an input bit stream to symbols ~~of~~ based on the selected signal constellation to encode the ~~characteristic~~ input bit stream in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated ~~symbols~~ carrier wave over the wireless channel~~;~~ ~~wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance~~.

58. (Currently amended) The computer program of claim 57, wherein the characteristic ~~of channel fading~~ comprises a signal to noise ratio.

59-60. (Cancelled)

61. (New) The method of claim 41, wherein the selected signal constellation comprises a plurality of sub-constellations.

62. (New) The method of claim 61, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

63. (New) The method of claim 61, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

64. (New) The method of claim 63, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

65. (New) The method of claim 61, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.

66. (New) The device of claim 49, wherein the selected signal constellation comprises a plurality of sub-constellations.

67. (New) The device of claim 66, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

68. (New) The device of claim 66, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

69. (New) The device of claim 68, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

70. (New) The device of claim 66, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.

71. (New) The computer program of claim 57, wherein the selected signal constellation comprises a plurality of sub-constellations.

72. (New) The computer program of claim 71, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

73. (New) The computer program of claim 71, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

74. (New) The computer program of claim 73, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

75. (New) The computer program of claim 71, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.